

Claim Listing

The following claim listing replaces all existing claims.

1. (canceled)
2. (canceled)
3. (canceled)
4. (canceled)
5. (canceled)
6. (canceled)
7. (canceled)
8. (canceled)
9. (canceled)
10. (canceled)
11. (Currently amended) The method of claim ~~10~~ 41 wherein the second electrode ~~comprises a~~ is the planar light-sensitive electrode, ~~the method further comprising the step of illuminating said second electrode with a predetermined light pattern, such that and wherein~~ the illumination in combination with the interfacial electric field ~~resulting in~~ formation of an ordered array of particles in a ~~designated area of the second electrode, said designated area being defined by the illumination pattern.~~
12. (Currently amended) The method of claim ~~10~~ 41 wherein the physical or chemical patterning of the second electrode, which is comprises a planar electrode, distributes the electric field in a predetermined manner so as to define having a surface and an interior, the surface or interior having been modified to produce spatial modulations in properties of the second electrode, said properties affecting the local distribution of the electric field at the interface, such that the generation of the electric field results in formation of an ordered array of particles in a designated area of the second electrode, said at least one designated area where the ordered array of particles is formed being defined by the spatial modulations in the properties of the second electrode.
13. (Currently amended) The method of claim ~~10~~ 41, wherein the second electrode comprises a silicon electrode.
14. (Currently amended) The method of claim ~~10~~ 41, wherein the second electrode comprises an ITO film.
15. (Previously Presented) The method of claim 14, wherein the ITO film is deposited on a flexible transparent substrate.
16. (Currently amended) The method of claim 12, wherein the ~~properties of the second~~

electrode ~~comprise~~ has been modified so as to affect its interfacial impedance or surface charge density.

17. (Currently amended) The method of claim 12, wherein ~~the spatial modulations of the properties of the second electrode is carried out by modifying the~~ second electrode also has an interior and the surface or the interior of the second electrode is modified by spatially modulated oxide growth, surface chemical patterning or surface profiling.
18. (Currently amended) The method of claim 12, wherein ~~the second electrode also has an interior and property of the second electrode being modulated comprises impedance,~~ one or more areas of the surface or the interior of the second electrode being are modified to exhibit low impedance, said areas of low impedance defining and wherein said at least one designated area where the ordered array of particles planar array of particles is formed are located in the areas of low impedance.
19. (Currently amended) The method of claim 12, wherein the second electrode ~~comprises a~~ is both physically or chemically patterned and light-sensitive electrode, said method further ~~comprising the step of illuminating the interface with a predetermined light pattern to form an~~ and said at least one designated area where the ordered array of the particles is formed is defined in accordance with the predetermined light pattern and the ~~modified properties physical or chemical patterning of the second electrode.~~
20. (Currently amended) The method of claim ~~10~~ 41, wherein the first electrode and the second electrodes ~~each comprise a~~ are both planar electrodes, ~~said first and second electrodes being~~ substantially parallel to another ~~each other~~ and separated by a gap, with the liquid medium containing the particles being located in the gap.
21. (Currently amended) The method of claim ~~10~~ 41, wherein the electric field is generated by applying an AC voltage between the first and the second electrodes, with or without application of a DC voltage.
22. (Currently amended) The method of claim ~~10~~ 41, wherein the particles, in forming the array, are transported in a direction substantially parallel to said interface.
23. (Currently amended) The method of claim ~~10~~ 41, wherein the ~~polarizable~~ liquid medium comprises an electrolyte solution.
24. (Currently amended) The method of claim ~~10~~ 41, wherein the particles are glass or polymeric beads.
25. (Currently amended) An array of particles ~~prepared~~ formed according to the method of claim ~~10~~ 41.
26. (withdrawn) A new method of forming an optical lens array, said method comprising the steps of claim 10, wherein the planar ordered array of particles in combination with the second electrode comprises a lens array.

27. (withdrawn) The method of claim 26, wherein the lens array enhances a light that passes through said array and impinges on the second electrode.
28. (withdrawn) A lens array prepared according to the method of claim 26.
29. (withdrawn) A method of forming an optical display comprising the following steps: forming a lens array of particles according to claim 26, wherein particles comprise large particles;
- providing a plurality of small particles and generating a time varying electric field to cause the small particles to selectively move under said large particles to form an on-pixel, and
- also causing the small particles to selectively move away from underneath the large particles to form an off-pixel in accordance with a selected frequency of said time varying electric field.
30. (withdrawn) The method of claim 29, wherein the small particles comprise fluorescent particles.
31. (withdrawn) The method of claim 29, wherein the small particles comprise reflective particles.
32. (withdrawn) The method of claim 29, wherein the lens array spatially modulates the intensity distribution of light incident upon the array.
33. (withdrawn) The method of claim 29, wherein the large particles have a diameter on the order of 10 microns and the small particles have a diameter on the order of 1 micron.
34. (withdrawn) An optical display prepared according to the method of claim 29.
35. (withdrawn) A method of forming a diffraction grating, said method comprising the steps of claim 10, wherein the planar ordered array of particles formed in the designated area of the second electrode comprises a diffraction grating.
36. (withdrawn) The method of claim 35, wherein the second electrode comprises an electrode having been patterned to provide linear regions of low impedance, said low impedance regions interspersed with regions of higher impedance, such that when an electric field is generated at the interface, a linear array is formed in each of the regions of low impedance, the resulting set of linear arrays comprising a diffraction grating, with the space in between the linear arrays comprising the pitch of said grating.
37. (withdrawn) The method of claim 35, further comprising the step of varying the magnitude or the frequency of the applied voltage of the electric field to modify the distance between the particles in the array.

38. (withdrawn) The method of claim 35, wherein the particles comprise a population of large particles and a population of small particles, such that when the electric field is applied to the interface, the large and small particles assemble into a planar ordered array, wherein the small particles are interspersed between the large particles and provide separation between large particles, the separation distance between the large particles being adjustable by varying the magnitude or frequency of the applied voltage of the electric field.
39. (withdrawn) The method of claim 38, wherein the large particles have a diameter on the order of 10 microns and the small particles have a diameter on the order of 1 micron.
40. (withdrawn) A diffraction grating prepared according to claim 35.
41. (Newly Added) A method of forming an array of particles, said method comprising the following steps:
- providing a first and second electrodes, each having a surface, said surfaces being opposed and positioned to accommodate a liquid medium between said surfaces, said liquid medium having polarizable particles suspended therein; and
- generating an electric field at an interface between the second electrode and the liquid medium, wherein the second electrode comprises either:
- (a) a light-sensitive electrode capable of controlling the movement of the particles and/or the liquid medium in a direction substantially parallel to the electrode surface when an electric field is generated within said interface and the light-sensitive electrode is illuminated with a predetermined light pattern, resulting in formation of an ordered array of particles in at least one designated area of the surface of the second electrode, said designated area being defined by the illumination pattern; or
- (b) the second electrode is physically or chemically patterned to distribute an electric field in a predetermined manner, when an electric field is generated within said interface, in order to control the movement of the particles and/or the liquid medium in a direction substantially parallel to the electrode surface, said patterning affecting the local distribution of the electric field at the interface, such that the generation of the electric field results in formation of an ordered array of particles in at least one designated area of the surface of the second electrode.
42. (Newly Added) The method of claim 41 wherein the refractive index of the particles is different from the refractive index of the liquid medium.